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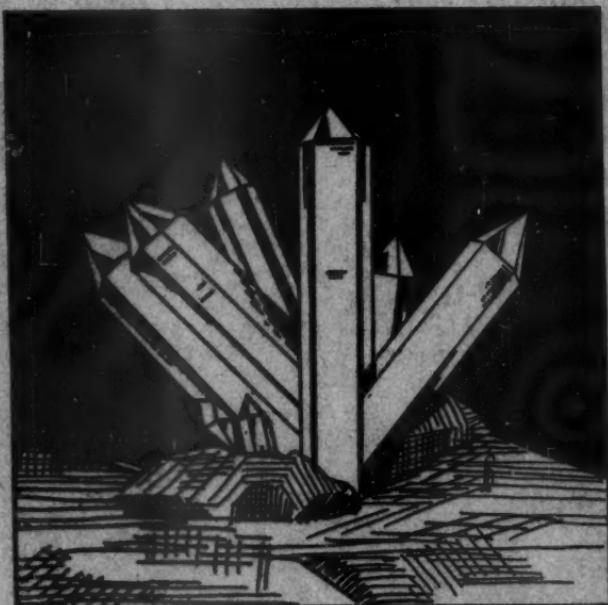
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VOL. 9, NO. 11

WHOLE NO. 41

ROCKS AND MINERALS

A MAGAZINE FOR MINERALOGIST, GEOLOGIST & COLLECTOR



OFFICIAL JOURNAL OF
THE ROCKS AND MINERALS ASSOCIATION

PUBLISHED MONTHLY



NOVEMBER, 1934

THE BULLETIN BOARD

On Entering Our 10th Year

Something for the Editor and Subscribers to think about.

In a recent issue of ROCKS and MINERALS, that subscribers might know this was their magazine, we asked for constructive criticisms; as to what department and articles appealed to them most, and what could interest them more. We have recently received a letter and cannot refrain from printing extracts from it.

Editor "R. & M":

"It is with much regret and yet no great surprise that I learn of the financial difficulties in connection with the publishing of ROCKS and MINERALS and as a research chemist and a mineral collector of 25 years' experience, I wish to express myself rather forcibly in this matter. My feeling is that it is going to take something more than money to keep the Rocks and Minerals Association going and its official magazine ROCKS and MINERALS. A number of the societies are now publishing their own magazines and little telling how many others may follow their example. Why is it that a mineral society, apparently an off-shoot of the Rocks and Minerals Association, just as soon as it gets beyond the baby stage, starts traveling in an entirely independent course and goes "bug-house" (pardon my slang) over the idea that it must publish its own magazine? Why in the name of common sense are these societies not conducted in the same way that well-known and successful organizations are being conducted by having ONE society (call it the "National Rocks and Minerals Association" or any other name), divide this into sections—and publish ONE GOOD MAGAZINE.

"Each section, instead of carrying out the insane idea of publishing its own magazine, would contribute financially to the publishing of the official magazine and in turn would have its own club notes and activities printed therein. Most of these notes and activities are of interest to the general reader.

"Such a magazine would be of far greater value to all subscribers; national advertisers would use its pages thereby greatly assisting in meeting the printing expense; and the subscription list would surely grow by leaps and bounds. I believe a few broad hints in this direction, printed occasionally in ROCKS and MINERALS, would not be wasted energy.

"The average reader is not going to take a half-dozen magazines in order to obtain a small amount of worth-while reading matter. I for one would be willing to pay more than double the present subscription price to ROCKS and MINERALS for a magazine ten times as good."

The writer then gives an illustration as to information published in ROCKS and MINERALS which has been of great value to him and refers to an article printed a few years ago describing a locality in the Connecticut valley where fossil fish could be obtained. At the first opportunity he visited the locality and secured "a specimen for which Mr. Ward informed me I would have paid \$15.00 to a dealer."

Such information he states can only be of value when full directions are given as to reaching the locality and as to the necessary preparation, if drilling or blasting is required.

As collecting becomes increasingly difficult "it is more necessary than ever for collectors to pull together and be free with their informa-

(Continued on Page 172)





ROCKS and MINERALS

A MAGAZINE FOR MINERALOGIST, GEOLOGIST
AND COLLECTOR

PUBLISHED MONTHLY ... FOUNDED 1926

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ROCKS AND MINERALS

PEEKSKILL, N. Y., U. S. A.

The Official Journal of the Rocks and Minerals Association

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ROCKS and MINERALS

Edited and Published by Peter Zodac

PUBLISHED
MONTHLY

NOVEMBER
1934

VOL. 9, No. 11

WHOLE No. 41

The Official Journal
of the
Rocks and Minerals
Association

Geology of the Connecticut Valley

By JOHN E. KITSON

Most of us, without devoting some study to the subject, are very likely to regard the great variety of physical features with which we are surrounded as practically unchangeable. Geologists tell us that beyond the shadow of a doubt, the face of the earth, as we behold it today, represents merely a single phase of a very long continued history. Geology deals with the history of the earth and its inhabitants as revealed in the rocks. It treats of the processes by which the earth has been and is now being changed, the materials and structure of the earth, the stages through which it has passed, and the evolution of the organisms which have lived upon it.

For untold millions of years, rocks at and near the surface of the earth have been crumbling, streams have been incessantly sawing into the lands, the sea has been eating into continental masses, the wind has been sculpturing desert lands, and great glaciers have plowed through mountain valleys and vast sheets of ice have spread over considerable portions of continents.

Throughout geologic time, the crust of the earth has shown marked instability. Slow upward and downward movements of the earth have been very common, amounting in many cases to thousands of feet. Various parts of the earth have been, and are being, affected by earthquakes, which are sudden movements along fractures in the outer crust. During almost inconceivable lengths of time, molten rocks have, at various times, been forced into

the earth's crust, and in many cases to its surface. Mountain ranges have been brought forth and cut down. Over this section of the continent, the sea has advanced and retreated repeatedly. Lakes have come and gone. Organisms have inhabited the earth for millions of years, the earlier forms being comparatively simple and low in organization, gradually evolving, through the ages, into more complex and highly organized forms.

It has been well established that any given epoch or period of geologic time had its characteristic assemblage of organisms, many of which are found in fossil form in the strata deposited during its period unless the formation has been so much altered that the fossils have been obliterated, which is the case in this particular section. We must, therefore, rely on the position of the rocks to determine their geologic age, the older rocks underlying the younger unless notably disturbed.

Rocks are divided into three groups: sedimentary or stratified, igneous or molten, metamorphic or altered. Sedimentary rocks are formed mechanically into sandstones, shales and clays from the disintegration and weathering of older rocks, the materials being carried away by wind or water and deposited elsewhere. Organically they are formed from animal and plant remains into limestones, chalk, coral, peat and coal; and chemically from materials once in solution into limestones, stalactites, gypsum, rock-salt and sinter. Igneous rocks are those which were forced to

the surface in a molten condition and cooled in the air or formed into rock masses and cooled under the pressure of overlying rocks. The former are called extrusives and are usually dark in color while the latter are called intrusives and are mainly granites and usually lighter in color. Metamorphic rocks are those of sedimentary or igneous origin which have been transformed by heat, pressure, and chemical action. Marble for instance, is the metamorphic equivalent of limestone, slate of shale, and gneiss of granite.

With this introduction, we may better understand the structure of the Connecticut Valley, which is a lowland extending from just north of Greenfield, Massachusetts, to New Haven, Connecticut, varying in width from a few miles at either end to fifteen or eighteen in the middle, between an Eastern and Western upland of folded igneous and metamorphic rocks. The Western upland shows evidences of two disturbances, first the folding which made mountains at the end of the lower Cambrian age, known as the Green Mountain uplift. This system was eroded to its roots and covered with the marine sediments of two more ages, Ordovician and Silurian, after which a disturbance in the Devonian age folded them and lifted the Berkshire region far above sea level.

The Eastern upland is the southern extension of the White Mountain highlands and consists of folded igneous and metamorphic rocks of Cambrian to Pennsylvanian age and folded into a mountain system during the latter part of the Pennsylvanian period.

The Connecticut Valley lowland differs greatly in its history. Early in the Triassic period, great faults developed in Eastern North America and great blocks dropped down in Nova Scotia, Massachusetts, Connecticut, New Jersey and Pennsylvania. The Connecticut Valley approximates one of the rift valleys thus formed. Just how deep it was at one time cannot be told as the valley probably dropped slowly in a series of movements; but it took at least ten thousand feet of deposits to fill the hole. The first part of the fill, is a coarse conglomerate sandstone which forms the bed rock of the valley. After about five thousand feet of this conglomerate had been laid down, a large fissure, extend-

ing from New Haven to Greenfield opened in the basin and a flood of lava poured over the valley. Following this a thousand feet or more of sandstone, not so coarse as the conglomerate, accumulated in the valley and then another period of volcanic activity spread a second sheet of lava over the valley floor. Of course the inwashing of sand continued until the valley was filled, but these last deposits were of much finer material than the others, and contain the Dinosaur tracks for which the valley is justly famous. Amherst College has a collection of twenty thousand tracks representing forty different kinds. Dinosaurs ranged in size from a bulk of eighty tons to the size of a Plymouth chicken. Some were meat-eaters; some were plant-eaters; some walked on two legs; some walked on four. The ones in this region ranged in size from two to thirty feet in length and were two legged flesh-eaters, whose tracks may be seen on a ledge of fine grained sandstone at Smiths Ferry, Massachusetts. This ledge is one of the finest of its kind known. Dr. Loomis of Amherst, describes the valley, at the time of the tracks, as a flat semi-arid plain which was flooded frequently with shallow muddy water which came down from adjacent hills, and Dinosaurs crossing the valley left their footprints in the soft mud, deposited as the water slowly drained away. The sun then baked in the tracks before the next layer was deposited. At the same time, breezes rippled the shallow water and underlying mud, and the ripples were baked in, in the same manner as were the tracks. This process continued until hundreds of feet were deposited, each layer representing a rainstorm in the adjacent hills. Reptiles dominated the earth for millions of years until for some unknown reason they became extinct.

After the long and very eventful period of accumulation of sandstones and lava, a great dynamic change took place. The valley deposits and the adjacent crystalline rocks heaved, faulted and cracked into great blocks which tipped toward the East. This is called the Block Mountain period of the valley. The faulting and tipping is well illustrated on the roads to Holyoke. There followed then a general wearing down of all the New England country.

Both the Eastern and Western highlands as well as the Valley. Block mountains were eroded down to a great plain near sea level. When this had been accomplished the completed plain experienced a broad uplift, extending from the Atlantic coast to what is now the St. Lawrence valley. This uplift being higher in the north created new rivers which began to flow south and wear down the land again, the Connecticut River and its tributaries doing the work in this region.

When the valley had been worn down to approximately the same condition that we now see—the hard resistant trap rock standing out as a mountain ridge, while the softer Triassic sandstones have been eroded down to within a hundred feet or so of sea level, the great glacier slowly worked down from the North and gouged out the bottom and sides and scraped and smoothed the hill tops, at the same time covering the surrounding country with ice thousands of feet in thickness. Glaciers may be called ice rivers in as much as they erode, transport and deposit. When we remember their great weight and thickness, we realize that they must rub with tremendous force upon their beds, and rock fragments

of all sizes embedded in the ice act as graving tools which plane, polish, and score the hard exposed ledges in its path, leaving a smooth billowy surface scored with straight parallel lines. Such surfaces are called glaciated. Mt. Tom has an abundance of such glaciated surfaces. The ice age, so called, lasted for thousands of years and its enormous weight depressed the valley below sea level, so that when it retreated it left a lake extending over the entire valley lowland. Of course, as soon as such a lake was formed, deposits of sands, gravels, muds and clays began to pile up under its surface and the gravel banks and clay pits of the valley are positive evidence of its existence. While these deposits were gradually filling the lake and the glacier was retreating farther and farther north, the depressed valley began to rise and the lake slowly drained away. The Connecticut River was again renewed and began to meander through the valley, depositing every time it overflowed its banks, a layer of sandy soil over the muddy clays of the lake bottom, thus creating for the past 25,000 years or so, a soil which is today unexcelled for the cultivation of onions and tobacco.



Copper Mountain (Snow-clad), Sulzer, Alaska. Many fine minerals, especially epidote, have come from this locality.

Idle Mineralogical Musings

By H. ALBAN ANDERSON

Sometimes, when my body is a little too weary of this world and my mental vision beholds in our smug civilization only the reflection of man's cupidity, avarice and meanness, I turn to my mineral cabinets, where the "rocks" I have collected seem, with all their hardness, to be softer than men's hearts. There, as I muse over specimens selected from this shelf or that for the beauty of form, color or physical content, and consider the analogies existing between mineral and human existence, the strain and stress of life become less tense: its disappointments, irritations and disillusionments gradually fade away, and a feeling of content comes over me as I reflect that if a mineral can endure the vicissitudes of existence in its kingdom, I, with my superior intelligence, should be able to face with equanimity those I must meet in mine.

But can I say a mineral is without intelligence? Must intelligence postulate a brain? Reason and wisdom may require such a delicate, complicated organism for their processes, but intelligence, the capacity to know, should be considered as existing in anything which, following the law of its being, manifests itself over and over again in forms so characteristic of its species as to render the species recognizable even in alterations and variations far from the perfect type. Reasoning thus, I am compelled, at this point, to invest the mineral with a spirit. And why not? For while we usually mean by "spirit," vital energy, limiting it to the life principle in man, is there not vital energy in this quartz crystal I hold in my hand? Certainly its molecules are manifestations of energy, and its tenacity, the power of its molecular cohesiveness to resist any pulling apart of the physical structure—a very vital principle in the existence of this crystal—is quite suggestive of a compelling, active spirit. Without it there would be disintegration of the crystal form, just as with the departure of the spirit of man there would be disintegration of his body.

So let us agree this crystal has a spirit. It is deserving of it, for it is one of those beautiful, symmetrical, doublyterminated specimens from Sutrop, Germany, which was privileged to develop under the most ideal conditions. Free from any of the vicissitudes usually besetting minerals, it reached almost absolute physical perfection. There are men, who develop so, but generally a lack of balance in the endocrin gland system makes them tall or short, fat or thin, to say nothing of qualities of character and behavior apart from the physical. And something similar to that happens to crystals, when the forces which should act along the crystal axes do not, because they are out of balance. Then there is departure from the typical form. That was probably the principal reason why this wonderfully clear Herkimer County crystal has not a perfect regular prism, and why the termination on one end is a line and not a point.

Then again a crystal may have a very contrary spirit. This cube of pyrite is an example of that. Apparently it was determined it simply would not be a pyritohedron. The striations on the plane surfaces, those on one face being parallel with those on the alternative face, are indications of the quite tremendous struggle it had to accomplish its purpose. For the striations are believed to be the edges of pyritohedral faces. Isn't that like the contrary spirit of a man, who could be a good brick layer or carpenter, but insists upon becoming a lawyer or a doctor? He is not always as successful as this pyrite has been, for this is a very beautiful cube.

And here is a specimen I purchased from Mr. Zodac because I was sorry for it. The poor thing never had a chance. In the very beginning, from the base for half its length, it was penetrated by black tourmaline. Caught, evidently, between faces and angles of crystals already developed on the one side, and forming crystals of superior strength on the other, it

was sadly cramped for room in which to expand. Three restricted and somewhat scarred planes of the prism were hardly won in the effort to perfect its form under such adverse circumstances. Pressure, or crystal interference on the pyramidal termination, squeezed out a snub-nosed apex beyond the interfering force and permitted only three imperfect, adjoining faces to form, but these three faces, coming into contact with some manganese, awakened a new hope. Undoubtedly the poor crystal thought that perhaps

it could be an amethyst. But, alas, there was only sufficient manganese to lightly tint the surfaces. And here it is, as much a specimen of the sorry defeat many a man has known after a life of striving, as it is a specimen of a very much misshapen crystal and an evidence of the oppression and disregard for the rights of others existing in the mineral kingdom. Alas!

Such are some of the thoughts I have as I stand before my mineral cabinets when the minerals seem to be less hard than some men's hearts.

Recent "Finds" of Interest

Rocks and Minerals would be pleased to have its readers submit short notes on their "finds" to this department.

Some interesting pyrite crystals, some of which have altered into limonite, chalcopyrite, epidote and a water-worn rock crystal have recently been found at Wrightsville Dam, Wrightsville, Vermont, by Norman F. Parody of CCC Camp 2201, Camp Weeks, Putnamville, Vermont.

A unique calcite that is both fluorescent and phosphorescent, has been found by Herman Wuestner of Cincinnati, Ohio. The calcite forms the binding material of a quartz conglomerate. Out of thousands of blocks of conglomerate examined, only two masses about 3 x 4 feet, show the phenomena. The color of the fluorescence is green. Mr. Wuestner has offered to write an article on the occurrence.

A beautiful specimen of brown jasper with veins of blue chalcedony was found in the gravel of Stony Creek, near Highway, West Hamilton, Calif. by Wm. C. Chandler of Chico, Calif.

A dainty little crystal of molybdenite, in granite, was found by Miss Violet Miller of Brooklyn, N. Y., at a road cut along the Seven Mile Road about ten miles north of Peekskill. This is the only crystal of molybdenite known from around Peekskill.

MINERALOGY QUIZ

(Answers on Page 172)

1. What is a mineral streak?
2. How is a streak commonly obtained?
3. What advantage has a streak?
4. What are striations on minerals?
5. How do striations run on quartz? on topaz?
6. What is manjak?
7. What do the following mean? xl? xls? xline? xled?

WHERE ARE THEY?

A. D. Blalock of 505 Wickson Ave., Oakland, Calif., whose very interesting article "The Emerald, Prince of Adventure" appeared in the September issue, has for years been trying to obtain gem specimens of corundum, spinel, and zircon in the matrix. Can

any of our readers supply him with such specimens or tell him from whom they may be obtained? He would also appreciate any information as to the sources, occurrences, or present location of these minerals in private collections in this country.

Mineral Oddities

The simplest way to identify halite is to taste it. Halite is common salt.

In the anthracite mines of Pennsylvania, pyrite is very common and often occurs in thin sheets of minute cubes which are very brilliant. These sheets are cut out in various shapes as square, rectangular, oval and circular and mounted in rings, tiepins and other articles of jewelry without any polishing of the crystals whatsoever. Pyrites so mounted are very popular.

with the hard coal miners and go under the name of "sulphur diamonds."

It is a peculiar fact that though many minerals occur in a wide range of colors, when powdered, the color for each group is always the same. For example, hematite, an iron ore, is found in deep red, gray to dark gray, and in deep black colors. If powdered no matter what its original color was, the color of the powder will always be deep red.

Collector's Kinks

Collectors are cordially invited to submit notes from their experiences and so make this department of interest to all.

A couple of months ago there appeared a "kink" telling of blowing a pan concentrate to further separate the heavy minerals. For the laboratory a better method than blowing is to use a bellows or a pump with a suitable pet-cock or other valve. A pressure of 10 pounds with a nozzle of 3/32" to 1/8" is satisfactory for most purposes.

Air concentration is an old prospector's trick, often used in the desert regions of Australia. I once construct-

ed an artificial blast for use in water-free regions. It was run by belt from the Ford to a 12" fan. The fan was housed in a wind-tunnel which opened under a hopper. Strength of the blast could be determined by opening vanes (of tin, about 1½" by 12") or closing them. Using a sharp-edged box, concentrates could be made simply and easily; reconcentration of the material was possible by increasing the blast pressure for the second run.

Piedmont, Ala. GILBERT HART.

CONSTRUCTIVE CRITICISMS

A reply to such correspondents as have favored us with opinions

Our request for suggestions for improving the magazine have been many and interesting. Some have asked that an annual directory be issued; others that the size of the magazine be increased; still others desire membership cards and an association pin. We would like to meet all these suggestions but at the low subscription price charged it would be impossible to do so. By increasing the subscription to \$2.00 a year it would be possible to en-

large the magazine one-half, making it 36 instead of 24 pages. We could also issue an annual directory of members together with membership cards.

Quite a number of our subscribers are already paying \$2.00 a year, voluntarily, saying the magazine is well worth that sum in its present form and contents. It is most gratifying to the Editor to have such wholehearted support and he wishes here to express to those subscribers, his very great appreciation of their much valued encouragement and assistance, which really enables us to give to our dollar subscribers a better magazine than they might otherwise receive.

Diamond Finds in the United States

By EUGENE W. BLANK, Scientific Editor "Rocks and Minerals"
Colgate-Palmolive-Peet Company, Jersey City, N. J.

PART II.

Diamonds in Virginia

The largest diamond discovered in the United States up to 1884 was found by a laboring man at Manchester, Virginia, in 1855, in some earth he was digging.¹² It was valued in Richmond at that time at \$4,000.00 and was later cut at an expense of \$1,500.00. Its form was that of a slightly rounded trigonal trisoctohedron, and in the rough it weighed 23½ carats; after cutting its weight was 11 11/16 carats. In color it was a faint greenish white with perfect transparency, but the refraction was somewhat impaired by a flaw or speck in the interior.

It is believed that the stone was brought down by the James River during spring floods from the Virginia gold fields. Exact copies of this gem, in glass, as it was found and as cut were deposited in the United States Mint Museum in Philadelphia and at the Peabody Museum in New Haven, Connecticut.

Pertaining to this diamond Cattelle says it brought a price considerably in excess of what it was worth. It was known afterwards as the "Dewey" diamond.

Peridotite occurs in West Virginia in Pendleton County, near the Virginia-West Virginia line. No diamonds or any trace of diamonds have been found in the state.

Diamonds in Kentucky

In his remarks on the "Genesis of the Diamond", C. Lewis alludes to the peridotite of Elliott County, Kentucky.¹³ Diller and Kunz report on this area as follows: "During a careful search over a small area for nearly two days, no diamonds were found; but this by no means demonstrates that diamonds may not yet be discovered there.

"The remarkable similarity between the peridotite of Kentucky and that of the Kimberley and other diamond-mines of South Africa is very striking, and, when this alone is considered, the probability of finding diamonds in Kentucky seems correspondingly great; but when we reflect that the carbonaceous shale, and not the peridotite itself, is the source of the carbon out of which the diamond is formed, and that the shale in Kentucky is much poorer in carbon than that of the South African mines, the probability of finding diamonds there is proportionally diminished."¹⁴

Shale from near the Kimberley mine contains approximately 37% of carbon while the blackest shale in Kentucky contains only 0.68% carbon.

Up to the present time there have been no authentic diamond finds in the state. A supposed diamond find is discussed by Miller.¹⁵

¹²Watson, "Mineral Resources of Virginia," p. 385 (1907).

¹³Lewis, "Genesis of the Diamond," Science Vol. 8, 345, (1885).

¹⁴Diller and Kunz, "Diamond Field in Kentucky," Science Vol. 10, 140 (1887).

¹⁵Miller, "Geology of Kentucky," Kentucky Geological Survey (1919).

A few pyropes of gem quality were found associated with the peridotite outcrop in Elliott county as well as several fairly good specimens of a green pyroxene. The latter resemble the South African specimens of the mineral being however somewhat less opaque and lighter in color.

Diamonds in The Great Lakes Region

A comparatively large number of emigrant diamonds of considerable size have been found in the Great Lakes region. The term emigrant is used to designate these diamonds because most of the stones have been found in close association with glacial drift deposited by the great ice sheet that covered the northern section of the United States some 80,000 years ago. From a study of the glacial movements it is inferred that the original source of the gems is in Canada, probably in the desolate territory lying south of Hudson Bay.

Indiana lays claim to as many as 20 diamonds found in Morgan and Brown counties during the last 35 years while panning for gold¹⁸. Blatchley mentions eight diamonds examined by himself¹⁹. The earliest discovery of diamond in Indiana is reported by Cox²⁰ who mentions a stone weighing 3 carats from Little Indian Creek, in Morgan county and the discovery of several diamonds in Brown county, one of which weighed 4 carats. Blatchley reports that the largest of the eight mentioned in his report was called the Stanley diamond. It was found in 1900 in a branch of Gold Creek, Morgan County. The stone was an octahedron and weighed 4 7/8 carats. It had a peculiar greenish-yellow tinge. The other stones ranged in weight from less than one-eighth of a carat to 1 21/32 carats and consisted of dodecahedral and hexoctohedral crystals of white, yellow, bluish and pink colors.

There are no peridotite areas in the state of Indiana.

Among the stones found in Wisconsin is the Eagle Stone, brought to Milwaukee in 1883 and sold for the sum of a dollar. It was discovered

while digging a well. Extensive litigation ensued when the real value of the stone was disclosed. The litigation was finally carried to the Supreme Court of the State of Wisconsin, which handed down a decision in favor of the defendant, on the ground that he had been ignorant of the value of the gem at the time of purchasing it. The town of Eagle boomed for a short time but after two more diamonds had been found the excitement died down.

Ten years later a white diamond was found at Oregon, Wisconsin by a farmer's lad while playing in a clay bank. Another diamond was discovered at Kohlsville in 1883. In addition in Wisconsin have been found the Saukville diamond, a beautiful white stone of six carats' weight, and the Burlington stone with a weight of a little over two carats. All these stones were found in the region of the "drift" left by the ice of the Glacial period.

Alden²¹ refers to five diamonds in his paper on the "Quaternary Geology of Southeastern Wisconsin."

One of the stones was found on Judson Devine's place, 2½ miles southwest of the village of Oregon. This stone is described by Hobbs²².

Another stone of 2 1/16 carat weight was found in the morainal deposits near Burlington.

The third stone discovered was the Eagle stone already referred to. It had a weight of 15 carats.

A 21 1/4 carat stone is reported to have been found in 1886 near Kohlsville (on or near the Green Lake moraine) by a farmer named Endlich.

Near Milwaukee River, about 3 miles north of Saukville, Ozaukee County, a fifth stone was discovered by Conrad Shaefer, a farmer, in 1896.

In Michigan has been found the Dowagiac stone, of approximately 11 carats' weight.

A diamond of six carats' weight has been found at Milford near Cincinnati, Ohio.

¹⁸Alden, "The Quaternary Geology of Southeastern Wisconsin," United States Geological Survey Professional Paper, No. 106, pp. 221, 239, 270, 301, 308 Washington, D. C., (1918).

¹⁹Blatchley, "Gold and Diamonds in Indiana," 27th Ann. Rept. Indiana Dept. Geology and Nat. Resources, p. 11 (1902).

²⁰Cox, Eighth, Ninth and Tenth Ann. Repts. Indiana Geol. Survey, p. 116 (1878).

²¹Hobbs, "The Diamond Field of the Great Lakes," Jour. Geology Vol. 7, 375 (1899). In this paper attention is directed to the desirability of search for diamond occurrences in the moraine line east of Ohio, in Pennsylvania and New York as a further guide to locating the original northern source of the stones.

Since all these stones have been found in the so-called "Kettle Moraine" which was the dumping ground of the glacial ice for its burden of boulders, gravel and clay, Hobbs has endeavored, with success, to prove that the diamonds were conveyed by the ice at the time of its later invasion of the country²¹. By tracing back the paths of the glaciers, which can be done by studying the direction of the grooves and ridges of rock over which the glacier has moved, geologists are able to differentiate the motion of the ice as a whole as well as each of its parts.

Study has shown that one of the highest summits of the ice cap was located some distance west of Hudson Bay, and that the ice cap which glaciated the Lakes Region was in Labrador to the east of Hudson Bay. From these two summits or ice caps the ice moved fanwise both northwards towards the Arctic Ocean and southward to the states always approaching the margins of the moraine at right angles to their extent.

To quote Hobbs²¹, "The evidence from the Oregon, Eagle and Kohlsville stones, which were located on the moraine of the Green Bay glacier, is that their home, in case they had a common one, is between the northeastern corner of the State of Wisconsin and the eastern summit of the ice mantle—a narrow strip of country of great extent, but yet a first approximation of the greatest value. If we assume, further, that the Saukville, Burlington, and Dowagiac stones, which were found on the moraine of the Lake Michigan glacier, have the same derivation, their common home may confidently be placed as far to the northeast as the wilderness beyond the Great Lakes, since the Green Bay and Lake Michigan glaciers coalesced in that region. The small stones found at Plum Creek, Wisconsin, and the Cincinnati stone, if the locations of their discovery be taken into consideration, still further circumscribe the diamond's home territory, since the lobes of the ice mass which transported them made

a complete junction with the Green Bay and Lake Michigan lobes or glaciers considerably farther to the northward than the point of union of the latter glaciers themselves.

If, therefore, it is assumed that all the stones which have been found have a common origin, the conclusion is inevitable that the ancestral home must be in the wilderness of Canada between the points where the several tracks marking their migrations converge upon one another, and the former summit of the ice sheet. The broader the "fan" of their distribution, the nearer to the latter must the point be located."

According to Kunz²² a diamond was found in a railway cut in the drift, along a railway line between Ottawa and Toronto, but that the exact locality is not known because of the death of the finder. He also regards that some of the Jasper and other stones found at one of the diamond localities south of the Great Lakes came from Thessalon, Ontario.

Diamonds In Idaho

According to Shannon²³ the only authentic occurrences of diamonds in Idaho were reported from the Rock Flat gold mine in Adams County at the head of Little Goose Creek Canyon five miles east of New Meadows. At this locality three small crystals were found in heavy concentrates from a testing operation on several cubic meters of gravel. The largest of the diamonds was an almost perfect octahedron weighing 1/3 carat and having a grayish color with typical greasy luster. The angles were rounded with a fused appearance. Ilmenite, chromite, zircon, magnetite, garnet, monazite and corundum crystals were associated with the diamonds.

A brief reference in an old Government publication states that diamonds have been reported from along the Owyhee river in Owyhee County. A few small stones have been reported and some were found in the placer mines, under the same conditions and of about the same quality as those found in the California gold placers. Some excitement has arisen from time

²¹Hobbs, "Emigrant Diamonds in America," *Pop. Sci. Mo.*, Vol. 56, 73 (1899). Reprinted in Smithsonian Institution Annual Report for 1901, pp. 359-366. See also: Hobbs, "On a Recent Diamond Find in Wisconsin and on the Probable Source of this and other Wisconsin Diamonds," *Amer. Geol.*, Vol. 14, 31 (1894).

²²Kunz, *Geol. Society America*, Vol. 42, 221 (1931).

²³Shannon, "Minerals of Idaho," *United States National Museum Bulletin No. 131* (1926).

to time concerning diamonds in Idaho. In 1864 to 1866 local mining papers made many references to reported or anticipated discoveries but little of importance was found. During the winter of 1892-93 the matter again attracted some attention. Only small quartz crystals were found, the name "Diamond Basin" having given color to the reported findings. Diamond Basin lies along Snake River in Owyhee county.

It is possible that a few small diamonds may occur in placers in other portions of the state but the possibility of gem stones being found is remote. The source of the Rock Flat crystals is not known, but the fact that chromite and a trace of platinum have been reported from the same claim may indicate their derivation from a small intrusive mass of peridotite.

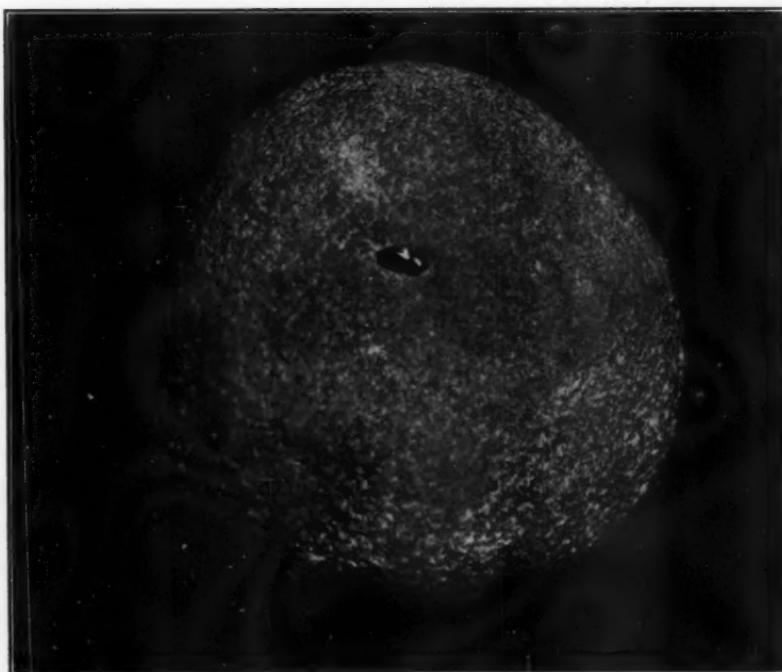
Dr. H. C. Dake has identified a number of microscopic diamonds in the black sands of Snake river, Idaho²⁴.

The diamonds noted were of a grayish-white color and more or less opaque. A few stones of a greenish color were also seen. Distinct crystals were not observed. Most of the stones appeared to be fragments of what at one time were possibly larger crystals.

A rather large number of placer concentrates, from this region were examined, but the presence of diamonds was noted in only two instances. The source of the diamonds in the Snake river sands is probably from some tributary stream which drains an area of intrusive peridotite.

²⁴Private communication.

To be Continued



While Mr. Blank is describing diamond localities in the United States, we are reproducing here an interesting illustration of a Brazilian diamond in matrix. A clear yellow gem half embedded in a conglomerate of waterworn quartz and spar grains. Natural size.

The Amateur Lapidary

Conducted by J. H. HOWARD*

504 Crescent Ave., Greenville, S. C.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

*Author of—*The Working of Semi-Precious Stones*. A practical guide-book written in non-technical language for those who desire to cut and polish semi-precious stones.

TIN LAPS FOR CABOCHONS

By J. H. HOWARD

There are certain gem materials usually cut cabochon which, when cut and polished by the regular methods used for cabochon work, present either a "wavy" or a "bumpy" appearance. This irregular appearance persists no matter how long the polishing may be continued on a soft lap. Among these materials is Jade.

I have never succeeded in overcoming this trouble with soft laps. But it can be controlled with tin laps. Taking Jade as an example, assuming you want to cut a cabochon with a flat back, try the following routine, modified in whatever minor ways may appeal to the individual:

Rough out the stone on a 100 carbo wheel.

Flat the back on cast iron lap with 600 carbo.

Polish the back on tin lap with paste of water and Carborundum Buffing Powder Grade A No. 1 Fine. Use speed of 1000 rpm, plenty of pressure and keep the lap wet to the end of the operation.

Cement the stone on the lapstick.

Smooth the rounded front with F carbo wheel.

Further smooth with 600 carbo paste on a tin lap. Or with F carbo on the periphery of a maple lap. Continue this until no further improvement noted.

Then with pumice and water, paste on hard felt lap. Add about 10 percent of 600 carbo to the paste.

Then polish with a paste of water and the above mentioned Buffing Powder on a piece of rawhide on the side of a wood wheel.

The gem will now have a complete polish but will be wavy or bumpy, manifesting these faults to the naked eye through distorted reflections and showing them very clearly under the magnifier.

These waves or bumps can now be taken off by polishing the entire surface on a tin lap with a thick paste of the Buffing Powder. Pressure and speed are not critical but I suggest about 1000 rpm with moderate pressure. As considerable material is to be removed, it pays to occasionally wash off the lap to remove the debris. The lap is to be kept wet.

Do not treat the flat base with any of the soft laps as you will only get it out of flat and require more work to bring it to flat again.

Grossularite, (The variety known as "South African Jade") yields very nicely to this same treatment.

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Don't Be Too Sure It's Mislabeled

By PETER ZODAC, *Editor "Rocks and Minerals"*

It very often happens that a collector acquires, by purchase or exchange, a specimen labeled as coming from his neighborhood and of a type he cannot believe is from his locality. He may well feel it has been mislabeled. But he might try seeking a local source for it and possibly might experience some surprising results.

A case in point is an amethyst specimen which the writer obtained about two years ago. At that time the Gem Shop of Helena, Montana, acquired the stock of a deceased mineral dealer, Fred Braun of Brooklyn, who had passed away many years ago. No specimen in the lot acquired by the Gem Shop had been collected less than 30 years prior to the Gem Shop's purchase. The writer, who is keenly interested in the minerals found around his native city, had made arrangements with the Gem Shop to forward him any and all specimens from the Braun stock which might have come from around Peekskill. Among specimens thus received, all of which were most interesting and some of which had not been represented in the writer's collection, was the amethyst.

Amethyst had never been known to occur around Peekskill, so far as the writer knew, and therefore he was skeptical as to its being properly labeled. True it was only an ordinary specimen—priced at 20¢—but nevertheless the writer could not believe it had come from Peekskill as he knew of no printed record of its local occurrence. Surely it must have been mislabeled before it was sent to the Gem Shop. Nevertheless, the writer did not accept this conclusion simply because he had heard nothing about the occurrence of amethyst in his locality. Many specimens are often found of which no record is ever made. However, if the specimen did originate in Peekskill the chances were that more specimens could be found and thus its locality definitely ascertained. Therefore it was assumed the specimen did really originate in Peekskill. But the next important point to learn was—where?

The specimen was carefully examined

to determine the type of rock such as granite, pegmatite, limestone, mica schist or gabbro it might have come from and with what minerals it could have been associated. Then a list was made of all mines, quarries and mineral localities within a radius of five miles. The next step was to try to fit the specimen to one of these localities.

Peekskill is in the extreme northwest corner of Westchester County and on the east bank of the Hudson River which separates Westchester from Rockland County. It was taken for granted the specimen did not come from across the river. It was also assumed that since the specimen was collected at least 30 years ago it might have been found in some workings in operation at that time and furthermore that the workings may have been some prominent mine or quarry rather than an inconspicuous road cut or an insignificant "gold mine" which was little more than a hole in the ground where such "ore" as may have shown was common pyrite.

The rock underlying the main part of Peekskill is mica schist; to the north are granites, gneisses, and limestones in which occur many deposits of iron, graphite, and pyrrhotite; to the east and south is a rare type of rock known as the Cortlandt Series which consists of gabbros, diorites, and norites and in which emery deposits occur. A careful study of the minerals found in the mines north of Peekskill did not place the amethyst as coming from there, nor from the emery mines either. For the amethyst was evidently formed in a crevice and resembled a flattened geode. No mineral resembling this in form had been noted by the writer as coming from any locality around Peekskill. Could it have come from Peekskill?

One day he chanced to show the specimen to Mr. Charles Travis who had been with him on many a collecting trip and stated his dilemma.

"Why, I know where that specimen must have come from. It's the old stone quarry on Croton Avenue, at Cro-

ton Lake. I'll bet any money that's the place," he answered.

"Gee whiz, Charlie, I'll bet you are right. I never thought of that."

The old stone quarry mentioned by Mr. Travis is in norite, about three miles south of Peekskill, and was worked about thirty years ago when the New Croton Dam was under construction. It was a large quarry in its day, supplying rock and crushed stone for the dam, but in the intervening years had been abandoned so that it was now overgrown with trees and bushes. We had visited it once but finding few specimens of interest had forgotten all about its existence. So the very next day we went to the quarry to examine it again. Three trips were made in succession and

on the third, on May 15th, 1933, Mr. Travis found small, pale but gemmy crystals of amethyst imbedded in a crevice in the solid wall of the quarry resembling the specimen concerning whose source we had been in doubt. The specimens found were of poor grade but they served the purpose—the locality for the amethyst had been found. Incidentally twenty-six other minerals were also found here during the trips. But what was still more important, a large number of mine pits whose existence we had known nothing of, were found a few hundred feet northwest of the quarry, which we would never have discovered if we had not gone out in search of a locality for a specimen which we had believed had been mislabeled.

T he Seven Devils Mining District

By MR. and MRS. ROBERT F. HOWARD

The Seven Devils Mining district is situated in a primitive and seldom visited section of the Seven Devils Mountains, lying in the northwest corner of Adams county, Idaho. This district with its rugged and magnificent scenery is best reached by a ten-mile trip over a rocky mountain road from the town of Cuprum, Idaho. Cuprum itself being situated at the edge of the mining district is reached by either of two routes; one by a forty mile trip northwest from Council, Idaho; and the other by a one hundred mile trip from Baker, Oregon, through Halfway, Copperfield, and Homestead. Three miles north of Homestead the road crosses the turbulent Snake River by way of a new bridge, and rises in six miles from an elevation of 1750 feet to an elevation of 4276 feet. These six miles are single track road, very dangerous, but affording a magnificent view of the Snake River Canyon with the Wallowa mountains in the distance forming the western horizon.

This district receives its name from the early Indian superstition that devils inhabited the seven major peaks in this mountain range. This superstition was due, no doubt, to their fear of the electrical storms occurring here,

which are magnificent and stupendous spectacles of the natural forces, reputed to be equalled by few other places in the world.

Upon arrival in Cuprum one may obtain lodgings and excellent board at the Darland Hotel, operated by Mr. and Mrs. J. A. Darland. Those interested will also find Mr. F. H. Kleinschmidt a well informed and very accommodating person who holds considerable interest in the mines of this district.

While in the majority of cases these mines have not worked for many years, the dumps by careful breaking and sorting will afford the collector many specimens of beauty and mineralogical interest. While the main ore of this district is bornite, chalcopyrite, and covellite, there also occur here many of the secondary minerals such as chrysocolla, tenorite, chalcocite, some azurite and malachite. The two latter do not occur in good specimen material. The ore bodies in this district are the result of a secondary magmatic intrusion. The main dikes consist of the top of a granite diorite, which was intruded through the limestones of this region. The walls of the contact are very rich in the calcareous

silicates, garnet, and epidote. The garnet, while it does not afford any material of gem quality, does make very beautiful cabinet specimens. With the garnet and epidote occur a number of the afore mentioned secondary copper minerals, due to the percolating through them of the solutions from the ore bodies themselves, and also from the small amount of primary copper ores contained within the garnet and epidote themselves. It will be seen from the above that the ore bodies occur neither in the limestone nor in the garnet zones, but are subsequent intrusions of lenticular shape lying in the shrinkage planes between the garnet and the limestone.

Detailed observation of this district and the examination of diamond drill cores indicate that enormous bodies of high grade ore lie beneath throughout the entire length of this huge dike, which is somewhere in the neighborhood of twelve miles in length. On

the extreme southern end of this dike is the Crackerjack Mine, the only one in this district now working. The formation in this case is slightly different than the northern and central portions and carries as its main mineral argentiferous tetrahedrite, classified by Dana as freibergite, together with small amounts of bornite, covellite and chalcopyrite. This ore body, while affording many beautiful specimens, is apparently too small for large scale mining operations.

Through the central and northern portions of this dike lie the Blue Jacket, the Queen, the White Monument, the Peacocks, and the Red Ledge, all of which in the past have produced comparatively large tonnage of highgrade ores from comparatively shallow working.

The original discovery of copper in this district was made about the year of 1880 by placer miners, who were placering for gold on what is now the site of the Peacocks.

Chips from the Quarry

Fragments Gathered by the Editor

The accident of broken bones appears as commonly among fossil animals of millions of years ago as among recent ones, according to Elmer S. Riggs, associate curator of paleontology at Field Museum of Natural History in Chicago. A large skeleton of a dinosaur on exhibition in Ernest R. Graham hall of the museum has a knot on one of its ribs which clearly shows that the rib had been broken and healed during the life of the animal. A skeleton of a wolverine-like flesh-eating mammal has the bones of the lower hind leg broken. The ends slipped past and healed in such a way as to make these bones one and half inches shorter than those on the opposite side. It is common to find two or three bones of a dinosaur's tail grown together in one piece. Broken and ulcerated teeth are also quite common.

A specimen of "Pele's hair" from the volcano Kilauea in Hawaii has been added to the collection of vol-

canic specimens in Clarence Buckingham hall at the Field Museum. It is a tangled mass of brown fibers spun from volcanic glass, and it closely resembles human hair in appearance. Pele, after whom the specimen is named, was the Hawaiian goddess of the volcano. She was supposed to live in the crater of Kilauea and to emerge from time to time.

The hairs are threads of volcanic glass spun from the molten lava of the crater.

The men of the CCC camps are engaged in much excavation and rock work in various sections of the country. Has it occurred to any of our enthusiastic collectors that here is an opportunity perhaps to find new and interesting mineral specimens by visiting the scene of operations? Apparently very little attention has been given to this uncovering and breaking of surface rocks,

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Coryneerinus, A new Devonian Crinoid Genus: By Edwin Kirk. Proceedings of the U. S. National Museum, Washington, D. C., pp 1-7, 1 plate. A crinoid specimen from Clark Co. Indiana, in the collections of the U. S. National Museum, was found to be of an unusual type, nearer certain European Devonian forms than any otherwise known in America. It is referable to a new genus and is described by Mr. Kirk as *Coryneerinus*.

Thirteenth List of New Mineral Names: By L. J. Spencer, M.A., Sc. D., F.R.S.; Keeper of Minerals in the British Museum of Natural History. (Reprinted from the "Mineralogical Magazine" September, 1934, Vol. XXIII, No. 146, pp. 624-640). The

pamphlet lists alphabetically a number of new names with a brief description of each.

Sands, Clays and Minerals The August issue of this unique English publication has been enlarged to 124 pages. It is profusely illustrated and contains many interesting articles among which are, "Economics of the Carboniferous Rocks" by J. E. Metcalfe; "Molybdenum and its Uses" by L. Sanderson, and "Limestones" by F. J. North. This interesting magazine is published by A. L. Curtis, P. O. Box 61, Chatteris, England.

Some Hamilton Crinoids of New York and Canada: By Winifred Goldring is the title of the scientific Bulletin just issued by the Buffalo Society of Natural Sciences (No. 3 of Volume 15).

This Bulletin describes the new species in the Reimann Collection owned by the Society and gives added information about some previously but imperfectly known species.

One of the species new to science—***Botryocrinus reimanni***—is a new meat-eating sea lily or crinoid was named by Dr. Goldring after its discoverer, Irving G. Reimann, Curator of Geology, Buffalo Museum of Science.

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